

### CLAIMS

1. An apparatus for the emission of a combined flux of electrons and electromagnetic radiations particularly suitable for the treatment of the atheromatous disease comprising:
  - a. two electric circuits (2, 2') with opposed polarity, a circuit with positive polarity (+) and the other one with negative polarity (-) fed by the same alternate current distribution network (10), each circuit comprising an electric or electronic device (7, 7') transforming the alternate current of said distribution network (10) into direct current and supplies a direct current with a voltage comprised between 4,000 and 80,000 V and an intensity comprised between 0.05 and 0.5 mA;
  - b. two outputs (8, 8') one of which (8) is connected to the circuit with positive polarity (+) and the other one (8') to the one with negative polarity (-), and
  - c. two plate terminal wires (9, 9'), each of them (9, 9') being provided with at least one bundle of

pointed wire elements (11, 11'), a wire (9) being connected to the output of said circuit with positive polarity (+) and the other wire (9') being connected to the output of said circuit with negative polarity (-),

characterized in that said apparatus is provided with means suitable for the identification of the coronary vessel corresponding to the stenosis or lesion to be treated and with control and drive means of said plate terminal wires so that the combined flux of electrons and electromagnetic radiations emitted is directed in a concentric and accurately targeted way towards said coronary vessel.

2. The apparatus according to claim 1, characterized in that the means suitable for the identification of the coronary vessel to be treated are constituted by a thoracic support (30) wherein a mapping of the coronary tree obtained by a chest X-ray and a coronarography examination is configured and, by measure the vessels to be treated and the x-axis and y-axis coordinates to set the goniometric measurements.

3. The apparatus according to claim 1 or 2, characterized in that the command and drive means of the plate terminal wires are light means (40) mounted on said plate terminal wires which are oriented in such a way to light the area to be treated and have a visual control of the area involved with the treatment.
4. The apparatus according to claim 1 or 2, characterized in that the control and drive means of the plate terminal wires are LEDS or nano-emitters, at least three in number, which are positioned around the area to be treated and, if required, they are detected from special cameras positioned on the two plate terminal wires.
5. The apparatus according to any of the previous claims, characterized in that it comprises a programmable timer (14), placed on at least one of the two electric circuits for the emission of an intermittent flux or at adjustable intervals.
6. The apparatus according to one of the previous claims, characterized in that the surface of the cross section of each bundle of pointed wire elements (11, 11') is comprised between 0.1 and 100 mm<sup>2</sup>.

7. The apparatus according to claim 6, characterized in that the surface of the cross section of each bundle of pointed elements (11, 11') is comprised between 1 and 10 mm<sup>2</sup>.
8. The apparatus according to any of the previous claims, characterized in that each bundle (11, 11') is constituted by a number of wire elements comprised between 100 and 10,000.
9. The apparatus according to any of the previous claims, characterized in that each bundle (11, 11') is divided into many groups of pointed wire elements and the groups forming a bundle can be up to 100 in number.
10. The apparatus according to any of the previous claims, characterized in that the pointed wire elements are carbon fibres.
11. The apparatus according to any of the previous claims from 1 to 10 designed to be used in the treatment and/or prevention of the atheromatous disease, wherein the stenosis is not higher than 75% and consists in:
  - taking an X-ray of the patient's chest and configuring, by a coronarography examination, a

mapping of the coronary tree by measure upon which the vessels to be treated are reported on a thoracic support (30);

- fix the thoracic support on the patient's chest in such a way that the reported vessels to be treated correspond to the patient's ones;
- place and insulate from the ground the part of the body corresponding to the stenosis or lesion to be treated in correspondence with the two bundles of pointed terminal wires (11, 11') of which one of the bundle (2) is connected to the output of direct current circuit with positive polarity (+) and the other bundle (2') is connected to the output of a direct current circuit with negative polarity (-);
- place and direct the two bundles of pointed terminal wires (11, 11') in such a way that the fluxes are directed in a concentric and accurately targeted way towards the lesion to be treated;
- check and if required adjust the position and the direction of said bundles of pointed wire elements (11, 11') in such a way that the relevant

fluxes are directed in a concentric and accurately targeted way towards the lesion to be treated and

- submit said part of the body to the action of a combined flux of electrons and electromagnetic radiations obtained by supplying a direct current with a voltage comprised between 4,000 and 80,000 V and an intensity comprised between 0.05 and 0.5 mA among said electric circuits.

12. The apparatus according to claim 11, characterized in that the combined flux of electrons and electromagnetic radiations is intermittent at adjustable and programmed intervals.

## AMENDED CLAIMS

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original claims 1-12 replaced by amended claims 1-12 (5 pages)]

1. An apparatus for the emission of a combined flux of electrons and electromagnetic radiations particularly suitable for the treatment of the atheromatous disease comprising:
  - a. two electric circuits (2, 2') with opposed polarity, a circuit with positive polarity (+) and the other one with negative polarity (-) fed by the same alternate current distribution network (10), each circuit comprising an electric or electronic device (7, 7') transforming the alternate current of said distribution network (10) into direct current and supplies a direct current with a voltage comprised between 4,000 and 80,000 V and an intensity comprised between 0.05 and 0.5 mA;
  - b. two outputs (8, 8') one of which (8) is connected to the circuit with positive polarity (+) and the other one (8') to the one with negative polarity (-), and
  - c. two plate terminal wires (9, 9'), each of them (9, 9') being provided with at least one bundle of

pointed wire elements (11, 11'), a wire (9) being connected to the output of said circuit with positive polarity (+) and the other wire (9') being connected to the output of said circuit with negative polarity (-),

characterized in that said apparatus is provided with means suitable for the identification of the coronary vessel corresponding to the stenosis or lesion to be treated and with control and drive means of said plate terminal wires so that the combined flux of electrons and electromagnetic radiations emitted is directed in a concentric and accurately targeted way towards said coronary vessel.

2. The apparatus according to claim 1, characterized in that the means suitable for the identification of the coronary vessel to be treated are constituted by a thoracic support (30) wherein a mapping of the coronary tree obtained by a chest X-ray and a coronarography examination is configured and, by measure the vessels to be treated and the x-axis and y-axis coordinates to set the goniometric measurements.



3. The apparatus according to claim 1 or 2, characterized in that the command and drive means of the plate terminal wires are light means (40) mounted on said plate terminal wires which are oriented in such a way to light the area to be treated and have a visual control of the area involved with the treatment.
4. The apparatus according to claim 1 or 2, characterized in that the control and drive means of the plate terminal wires are LEDS or nano-emitters, at least three in number, which are positioned around the area to be treated and, if required, they are detected from special cameras positioned on the two plate terminal wires.
5. The apparatus according to any of the previous claims, characterized in that it comprises a programmable timer (14), placed on at least one of the two electric circuits for the emission of an intermittent flux or at adjustable intervals.
6. The apparatus according to one of the previous claims, characterized in that the surface of the cross section of each bundle of pointed wire elements (11, 11') is comprised between 0.1 and 100 mm<sup>2</sup>.

7. The apparatus according to claim 6, characterized in that the surface of the cross section of each bundle of pointed elements (11, 11') is comprised between 1 and 10 mm<sup>2</sup>.
8. The apparatus according to any of the previous claims, characterized in that each bundle (11, 11') is constituted by a number of wire elements comprised between 100 and 10,000.
9. The apparatus according to any of the previous claims, characterized in that each bundle (11, 11') is divided into many groups of pointed wire elements and the groups forming a bundle can be up to 100 in number.
10. The apparatus according to any of the previous claims, characterized in that the pointed wire elements are carbon fibres.
11. The apparatus according to any of the previous claims from 1 to 10 for use in the treatment and/or prevention of the atherosclerotic disease, wherein the stenosis is not higher than 75%, consisting in orienting the two bundles of pointed wire elements (11,11') in a targeted and concentrated way towards the part of the body insulated from ground, corresponding to the stenosis or lesion to be treated, and delivering between said bundles (11,11') a direct current having a voltage comprised between 4,000 and 80,000 V and an intensity comprised between 0.05 and 0.5 mA.

12. The apparatus according to claim 11, characterized in that the delivery of the direct current is intermittent.